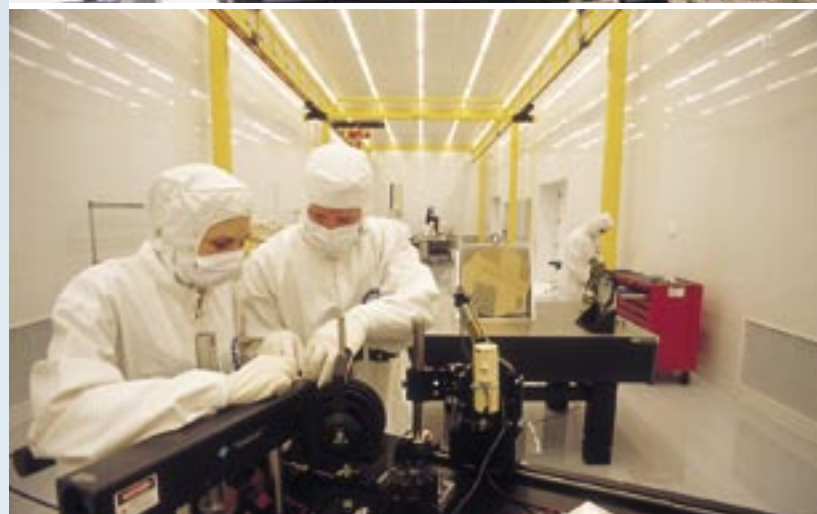


# REASON TWO

By Jeff Vanek

## Utah's Universities Powerhouses of Economic Development



**IT'S A NEW ERA IN UTAH.** The state was settled by waves of pioneers who tamed a desert and built a world-class city that would one day host the Winter Olympics. They did it by harnessing the resources they had.

In the 1800s, water was the vital resource. Utahns built dams, reservoirs and irrigation canals to capture and channel the runoff from the snow in the mountains. Today, however, technology is Utah's vital resource, found in abundance at the state's major universities. Today's Utahns are capturing and channeling technology into economic opportunity.

Utah has two major public research universities—Utah State University and the University of Utah—in addition to Brigham Young University, the largest private university in the United States. All three institutions turn out an impressive list of technologies and business spin-offs from the research conducted on their campuses.

It was Utah universities that supplied much of the technologies that led to the creation of companies such as Atari, Adobe Systems, Evans & Sutherland, Iomega, Novell, Pixar and Silicon Graphics. Utah universities developed synthetic diamond technology and implanted the first artificial heart into a human. More disease-related genes have been discovered at Utah research universities than in any other place in the world.

### THE ECONOMIC POWER OF RESEARCH UNIVERSITIES

To better harness and leverage the world-class innovations being developed at Utah universities, a focused effort is being developed by educational, business and government leaders in the state.

These leaders are working collaboratively to ensure that the right steps are taken and funding is secured for economic development, with the universities as the cornerstone of the plans. "We want our universities to be two-way streets," said Lane Beattie, president of the Salt Lake Chamber of Commerce. "We want them to spin off businesses and be places where businesses go

to get the technologies they need. Stable economic growth comes from the stimulation of new thought, technologies and inventions."

Beattie points to China as a country that understands the ties between research universities and the economy. "China has plans to open a hundred research universities as part of its long-term economic growth strategy," he says. "Utah must likewise put significant investment in the research universities located in the state." Jon Huntsman Jr., Utah's newly elected governor, agrees with the importance of strengthening the state's universities.

You don't have to go to China to understand the importance of strong research universities in vibrant economies. If you look at leading economic regions around the U.S., one thing they almost always have in common is ties to world-class research universities. Silicon Valley, the Boston area, Texas and North Carolina have all established symbiotic relationships between major research universities, government and industry.

### USTAR

One of the most significant recent economic development efforts in Utah was the passage of the Utah Science, Technology and Research Initiative (USTAR) by the state legislature. USTAR is designed to advance the long-term economic growth of the state through technology commercialization efforts at Utah's research universities.

The Utah legislature appropriated funds to be used by the University of Utah and Utah State University for recruiting key talent and purchasing equipment. Initial spending will be centered on research clusters at the two universities; including brain imaging studies, advanced information technology and visualization, microensors, infectious disease, and sensor design.

USTAR will also strengthen the state's Centers of Excellence program, which already funnels money into technology development efforts at the universities. As part of the initiative, Centers of Excellence has changed the focus of the invest-

ments the state makes. In the past the focus was on moving research to the technology stage. The program will now have a technology-to-market emphasis, says Martin Frey, managing director of the Governor's Office of Economic Development.

#### FROM AGRICULTURE TO SPACE

Utah State University is located in Logan, about 90 miles north of Salt Lake City. Space research through USU's Space Dynamics Laboratory has been a significant area of technology development for the university. The center has created significant technologies in data compression, visualization capabilities and sensors. In fact, more experiments have been sent into space from USU than from any other university in the world. Other major areas of research and technology development include micro-biotechnology, cellular systems and nutrition, and autonomous robotic vehicles.

USU is currently instituting changes that go to the heart of the institution's culture. "We have initiated changes that are very strongly driven by our desire to be competitive, to be more of an enterprise institution, and to help change the culture of the traditional academic environment to become a more entrepreneurial one," says Brent Miller, vice president for research at USU. "We have done a number of things to try and help our faculty recognize the importance of moving their ideas into the public realm so that they benefit society."

One of the changes made was in the faculty code. Patent and other intellectual property creation is now a part of tenure consideration. "That's very unusual at universities and we are really pleased to have done that this year," Miller says.

Another significant change was a revision of the university's intellectual property policy for royalty sharing. Traditionally, royalties from licensed technologies are split in thirds: one-third to the professor who developed the technology, one-third to the department and one-third to the university. In order to create a greater incentive for technology commercialization, the university has changed that traditional split. Now the professor gets a 50 percent share of royalties in the licensed technology for the first half million dollars. After the first half million in royalties, the professor's share is forty percent.

USU is also establishing a business incubator on the campus to assist professors in commercializing their technologies. This is being done by leveraging the resources of the MBA program with the Technology Transfer Office's intellectual property resources. Rather than merely focusing on licensing technologies, the university is encouraging new business creation.

The university has also refocused its Technology Transfer Office, bringing in key people from the private sector with experience in technology commercialization. This has resulted in the formation of seven companies in the

last two years, and a doubling of royalty revenues in that same period.

The USU Innovation Campus is a blend of university and private research facilities on land that sits adjacent to the main campus. Originally, the campus was 36 acres. It is now expanding to 150. The Innovation Campus focus is on those sectors of research in which the university already has strong programs—biotech, agriculture, aerospace with intelligent systems, sensors and robotics. Both startups and established companies are encouraged to locate their facilities at the campus. The idea is to create a synergistic environment where research, technology development and technology commercialization will more readily occur.

#### UTAH'S MEDICAL PILLAR

Located in Salt Lake City, the University of Utah is ranked in the top 15 percent of research institutions in the United States. It was one of the original four universities to be involved in the development of the ARPANET, the precursor to the Internet. Some of the U's greatest strengths are in biomedicine and computers. Its biomedical and genetics research programs are among the very top in the nation. The university's Brain Institute is doing leading-edge research and development in the area of genetic brain function. In the area of computer technology, the Scientific Computing and Imaging Institute is breaking new ground in engineering, computing, visualization and imaging.



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Like USU, the University of Utah has made some significant changes aimed at taking research to the market through licensing and the creation of new businesses. This direction was articulated by Michael Young, the new president of the University of Utah, in his inauguration speech: "An essential ingredient of our relationship to the state and to the community... lies in the commercialization of our research... To that end, we must move our best research and our cutting-edge technology from the laboratory bench to the bedside, from the test tube to the market."

To ensure that the U's research benefits many people now and in the future, the institution recently created the Office of Technology Venture Development. Headed by Jack Brittain, the U's first vice president for technology venture development, the office will identify emerging technologies and oversee their maturation to the marketplace, Young says.

The appointment of Jack Brittain as vice president of that office is especially significant in that Brittain has been and remains the dean of the School of Business. Under Brittain's leadership, the Tech Venture Office oversees several supporting programs, all focusing on accelerating business creation and technology development.

"In addition to businesses based on technology from the university, I

think our entrepreneurial programs are less appreciated and more significant than people realize," says Brittain. "These programs are a foundation for companies coming out of the university; our students start a lot of companies."

Several programs fall under the Tech Venture Office that contribute to the technology commercialization efforts of the university. In the past, company formation based on research happened, but now it is being actively encouraged and supported. The Virtual Incubator Project, sponsored by the U's Technology Commercialization Office (formally called the Technology Transfer Office), awards \$50,000 in seed capital to young startup companies that are commercializing university research. In addition, other resources from the university are made available to make the entire campus an incubator that accelerates the research and development cycle so technologies can reach the market faster.

Also under the Tech Venture Office is the Lassonde Entrepreneurship Center, which runs the Launch Pad Program. The program brings students together from both the business school and the engineering schools for the purpose of creating a business based on technologies developed at the university. As Leonard Black, entrepreneurial director of the center, explains, "The idea behind this center is to take some students from business, engineering and life sciences, examine what they have in common with the Technology Commercialization Office, develop some relationships with the research people and find economic opportunities."

Troy D'Ambrosio, executive director of the Lassonde Center, adds, "Our idea is to create as many businesses as we can using student teams." Even though the Launch Pad program is only about a year old, it plans to spin out two new businesses this year.

#### THE PRIVATE EFFECT

Brigham Young University will remain a major player in Utah's economic development. BYU is located in Provo, about 60 miles south of Salt Lake City. Although not primarily a

research university, BYU is extremely effective when it comes to technology development and commercialization, ranking third in the nation in earning income from inventions relative to research spending.

BYU has a very close working relationship with both the University of Utah and Utah State University, often collaborating with either of the state schools to develop new technologies. "We collaborate very closely with the tech transfer offices at the University of Utah and Utah State," says Lynn Astle, director of BYU's Technology Office. "We aren't in competition with each other—there are a lot of synergies that we have, and our technologies are different than their technologies. A lot of this activity comes from collaboration between our faculties."

This approach makes sense given the teaching orientation of BYU. All faculty members must carry a regular class load, whereas at the U and USU there are faculty members who engage primarily in research. Nevertheless, BYU faculty and students have come up with impressive research and manage to spin off about three companies. One of the ways that the BYU Technology Transfer Office leverages resources is by tapping talent at the university's law school. Law students who are planning to become patent attorneys perform patent research and other due

diligence on intellectual properties developed at the university.

Recently, the state's Centers of Excellence Program awarded funding for four research projects at BYU. These projects include advanced communications technology in wireless communication, miniature unmanned air vehicles using autopilot guidance systems, direct machining and control for optimizing production specifications and tolerances, and acoustics research to reduce noise in vehicle cabins. Each of these technologies has significant market potential, and most are already in the commercialization stage.

These projects represent only a small part of what is being developed at BYU. For example, another technology being commercialized at the university is Friction Stir Welding, which allows previously unweldable metals, such as stainless steel or armor plate, to be welded. The technology took first place in the 2005 Stael Rives Utah Innovations Awards in the mechanical devices category.

Each of Utah's three major universities provides a wealth of technologies for commercialization. It will now rest on the state's educational, business and public leaders to put the necessary infrastructure in place that will allow this vital resource to be maximized for economic growth.

